Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims:

1.(Currently Amended) A current sensor arrangement for measuring a subject electrical current flow, said current sensor arrangement comprising:

an elongated conductor having fixed dimensions, and being configured for producing a generally planar magnetic field within a spatial region adjacent said conductor when said subject electrical current flows therethrough;

a magnetic field sensing device which produces a signal voltage in response to a magnetic field in a particular direction therethrough, the magnitude of which signal voltage is approximately linearly related to the magnitude of said magnetic field in its vicinity, at least over a limited range of magnetic fields, which magnetic field sensing device may be temperature-dependent or variable in its sensitivity from device to device, said magnetic field sensing device being located in said spatial region with said particular direction generally parallel to said planar magnetic field, whereby said magnetic field sensing device produces a magnetic-field-representative signal voltage in response to said magnetic field;

controllable test current generating means magnetically coupled to said spatial region, for, when energized, generating a predetermined current flow for generating a test magnetic field component in said spatial region, which test magnetic field component is generally parallel with, and in the same polarity as, said planar magnetic field, whereby said magnetic field sensing device produces a magnetic-field-representative signal voltage related to the magnitude of the sum of said subject electric

current and said predetermined current;

control means coupled to said magnetic field sensing device and to said test current generating means, for recurrently energizing said controllable test current generating means, and for determining the magnitude of said current flow in said elongated conductor from at least (a) the magnitude of said magnetic-field-representative signal voltage during those times during which said controllable test current generating means is energized, (b) the magnitude of said magnetic-field-representative signal voltage during times in which said controllable test current generating means is not energized, and (c) the magnitude of said predetermined current.

2.(Original) A current sensor arrangement according to claim 1, wherein said magnetic field sensing device is one of a giant magnetoresistive device and spin-dependent tunneling device.

3.(Original) A current sensor arrangement according to claim 1, wherein:

said test current generating means is galvanically coupled to said elongated conductor adjacent said spatial region, for causing said test current to flow through said elongated conductor; and wherein

said control means comprises switching means, for, when in the conducting state, gating said predetermined current to said elongated conductor, and for, when in the nonconducting state, preventing said predetermined current from flowing in said elongated conductor.

4.(Original) A current sensor arrangement according to claim 3, wherein said conducting means comprises current conductors connected to said elongated conductor on either side of said spatial region.

5. (Currently Amended) A current sensor arrangement for measuring a subject electrical current flow, said current sensor arrangement comprising:

an elongated conductor having fixed dimensions, and being configured for producing a generally planar magnetic field within a spatial region adjacent said conductor when said subject electrical current flows therethrough;

a magnetic field sensing device which produces a signal voltage in response to a magnetic field in a particular direction therethrough, the magnitude of which signal voltage is approximately linearly related to the magnitude of said magnetic field in its vicinity, at least over a limited range of magnetic fields, which magnetic field sensing device may be temperature-dependent or variable in its sensitivity from device to device, said magnetic field sensing device being located in said spatial region with said particular direction generally parallel to said planar magnetic field, whereby said magnetic field sensing device produces a magnetic-field-representative signal voltage in response to said magnetic field;

controllable test current generating means magnetically coupled to said spatial region, for, when energized, generating a predetermined current flow for generating a test magnetic field component in said spatial region, which test magnetic field component is generally parallel with said planar magnetic field, whereby said magnetic field sensing device produces a magnetic-field-representative signal voltage related to the magnitude of the sum of said subject electric current and said predetermined current;

control means coupled to said magnetic field sensing device and to said test current generating means, for recurrently energizing said controllable test current generating means, and for determining the magnitude of said

current flow in said elongated conductor from at least (a) the magnitude of said magnetic-field-representative signal voltage during those times during which said controllable test current generating means is energized, (b) the magnitude of said magnetic-field-representative signal voltage during times in which said controllable test current generating means is not energized, and (c) the magnitude of said predetermined current, ~~according to claim 1,~~ wherein:

said controllable test current generating means comprises a second electrical conductor extending through said spatial region, electrically isolated from said elongated conductor; and

said control means comprises switching means, for, when in the conducting state, gating said predetermined current to said second electrical conductor, and for, when in the nonconducting state, preventing said predetermined current from flowing in said second electrical conductor.